Enzymes of germination.—DELEANO[20] has made a somewhat disconnected study of the transformation of oil and the concomitant occurrence of various enzymes in the castor bean during the process of germination. The tables relating to the oil content of the seeds (freed from coats) on successive days of germination show that the oil content is practically constant during the first eight days of germination, after that decreasing so rapidly that by the fifteenth day it has nearly all disappeared. Samples equivalent to those used for analysis were taken each day, ground up, and subjected to autolysis in 50–100^{cc} of water, with a little toluene, for ten hours. The oil was saponified with increasing rapidity as germination advanced. Thus on the first day no autolysis took place; on the fourth day 5 per cent.; and on the sixth day 98 per cent. of the oil was hydrolyzed in ten hours. The accumulation of fatty acids did not take place. From these experiments the author concludes, in agreement as he supposes with LECLERC DU SABLON, that the oil is not saponified in the cells, but that saponification takes place only when the correlation of the cells is destroyed. This conclusion is scarcely warranted, since the products of hydrolysis of the oil are probably removed as soon as formed and still further changed. This is the almost universal course of enzymic activity in living plants, while it is also universally true that only when the correlation of the cellular processes is interrupted can the activity of the enzymes be clearly demonstrated by the accumulation of the products of enzymic activity.

The relative abundance of some of the enzymes at successive stages of germination was also determined. Catalase increases at first and then decreases with the disappearance of the oil. The oxidases increase for a time and then remain fairly constant. The author also believes that he has shown the presence of a reducing enzyme. The work on these enzymes is not of sufficient extent to allow any general conclusions regarding their functions.—H. HASSELBRING.

Ambrosia fungi.—NEGER has been giving attention to the fungi associated with certain insects, which utilize them for food. The monilia-like cells that the insects eat he proposes to call ambrosia, a generic term like nectar, bee-bread, etc., and the fungi are to be designated as ambrosia fungi. In his first paper[21] he considers the ambrosia galls (a happy substitute for zoomycocecidia) produced by gall-mites of the genus Asphondylia, in which the insect undergoes its development from egg to imago. The gall cavity is lined with a hymenium-like layer of fungus filaments producing spherical monilia-like cells, the ambrosia. Later pycnidia are formed on the external surface of the gall after the insect has

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[20] DELEANO, N. J., Recherches chimiques sur la germination. Centralbl. Bakt. Parasit. Infectionskrank. **24**^{2}**:**130–146. 1909.

[21] NEGER, F. W., Ambrosiapilze. Ber Deutsch. Bot. Gesells. **26a:**735–754. *pl. 12. figs. 2.* 1908.

escaped. The fungi peculiar to these galls belong to the genus Macrophoma, and are not referable to the species of Phoma that inhabit the same hosts.

In a second paper[22] NEGER treats the fungi associated with certain wood-boring beetles, *Xyloterus dispar*, *X. lineatus*, and *Hylecoetus dermestoides*, which form ambrosia upon the walls of their tunnels. The fungus related to Hylecoetus is probably a species of Endomyces; the other two are closely similar, but not identical, and are not identifiable. The species of Ceratostomella, which NEGER formerly mistook for ambrosia fungi in this case, are merely weeds in the fungus garden (as are also yeasts and bacteria), which have no part in producing the edible cells. The larvae of these beetles have thus, in their mouths almost, nutr tious food abstracted by the vegetative mycelium from the more distant wood cells, instead of the relatively poor food, the wood itself; moreover, the borings are confined to the sap-wood, where the fungi find appropriate conditions for growth.—C. R. B.

Ovule and ovulate flower of Juglans.—BENSON and WELSFORD[23] have investigated the ovule and ovulate flower of Juglans in reference to the discordant results obtained by VAN TIEGHEM (1869) and NICOLOFF (1905). The "allied genera" examined for comparative study were Myrica, Carpinus, Morus, Urtica, and Rheum. In brief, it may be said that the account of VAN TIEGHEM was confirmed in all particulars. Interesting phases of "reduction" exhibited by the flowers of *Juglans regia* are as follows: (1) the origin of a dimerous condition from a trimerous, (2) barren placentae with a vascular supply, (3) one mode of the phylogenetic origin of the orthotropous basal ovule from an anatropous parietal type.

More extended conclusions deal with the so-called epigyny of the group considered, and with the ovule in angiosperms. The investigators find in the group "no trace of that form of epigyny which is brought about by the concavity of the axis and sinking and inclusion of the ovary within it," which description hardly applies to epigyny anywhere. It is concluded that the described epigyny of Amentiferae need not be regarded as an advanced character, and that the term had better be avoided. The conclusions as to the ovule of angiosperms are: (1) it is appendicular, (2) it is phylogenetically provided with a dual integument, and (3) the vascular supply may be compared with that of the outer integument or "cupule" of Lagenostoma.—J. M. C.

Aridity and evolution.—Of the external factors which have influenced or caused the evolution of the plant kingdom, MACDOUGAL[24] places much stress

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22 NEGER, F. W., Ambrosiapilze II. Ber. Deutsch. Bot. Gesells. **27**:372–389. *pl. 17. figs. 2.* 1909.

23 BENSON, M., AND WELSFORD, E. J., The morphology of the ovule and female flower of *Juglans regia* and of a few allied genera. Annals of Botany **23**:623–633. *figs. 8.* 1909.

24 MACDOUGAL, D. T., Influence of aridity upon the evolutionary development of plants. Plant World **12**:217–231. 1909.